

Trend Study 14-20-99

Study site name: Gooseberry .

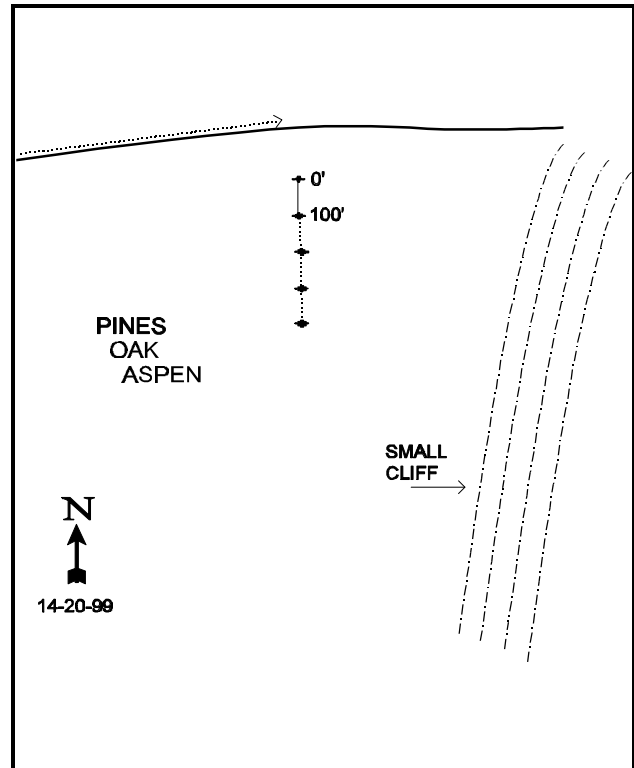
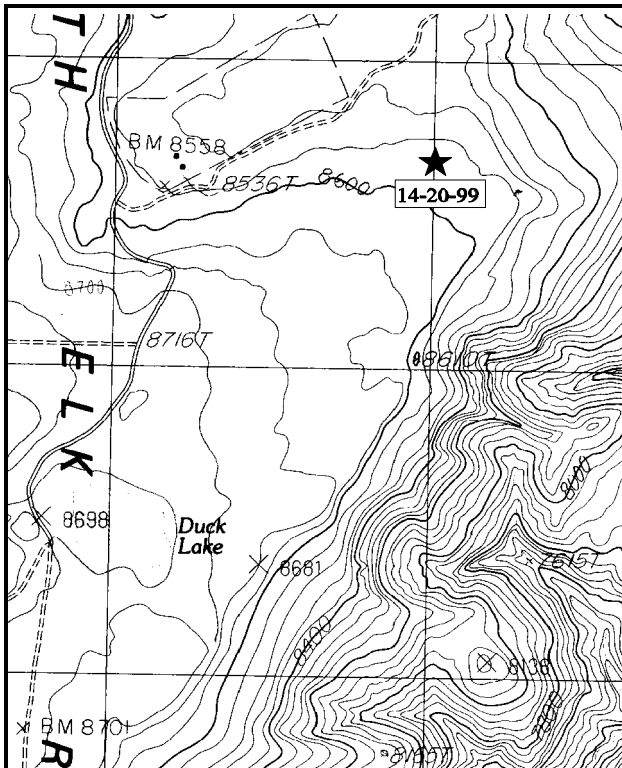
Range type: Selective Logged-Ponderosa Pine.

Compass bearing: frequency baseline 165°M.

Footmark (first frame at) 5 feet, footmarks (frequency belts) line 1 (11 & 71ft), line 2 (34ft), line 3 (59ft), line 4 (95ft).

LOCATION DESCRIPTION

Drive 0.05 miles south past the turnoff to the Gooseberry Guard Station on Elk Ridge to a road turning off to the left (east). Proceed down this road past the guard station, corral and water troughs for 0.9 miles and stop (If you go to far, the road starts to drop down 150 feet past this point). The 0-foot baseline stake is 100 feet south, and is marked by a green full-high fence post tagged with browse tag #7878. Fence posts were used to mark all the transect plots.



Map Name: Poison Canyon

Diagrammatic Sketch

Township 34S , Range 20E , Section 18

UTM 4187261.436 N, 609065.383 E

DISCUSSION

Trend Study No. 14-20 (36-8)

The Gooseberry Interagency trend study samples mixed ponderosa pine-aspen summer range on North Elk Ridge. The study is found at an elevation of 8,500 feet and just west of the rim where the level plateau drops off a steep and deep rocky cliff into Cottonwood Canyon. Thick aspen groves dominate below the rim, but on top aspen clumps are scattered through the predominately ponderosa pine forest. Old growth pines were removed with a selective over story harvest in 1963. The area was scheduled for a shelter-wood cut in 1993 or 1994. Some logging activities were evident during the 1999 reading. Slash was common on the site and logs were piled up on the nearby road. Several small aspen along with study site fence posts were bent over by logging equipment.

The Forest Service manages grazing on the area, which is in the Gooseberry allotment. The grazing system involves rotation grazing with three pastures in the allotment. These units are never rested for an entire season, which is June 1 to October 15. The stocking rate is 200 head of cattle. Water is available in nearby Duck Lake where deer, elk, and cattle are frequently seen. Otherwise, water is limited on top of the plateau. Several deer were seen near the study site in 1999. Pellet group data from the site estimate 11 deer days use/acre (27 ddu/ha), 11 elk days use/acre (27 edu/ha), and 26 cow days use/acre (64 cdu/ha). Cattle pats appear to be from last season, but most of the deer and elk pellet groups appeared more recent.

Soil depth is highly variable with some areas of exposed bedrock. Effective rooting depth estimates vary from 13 to 28 inches. Soil texture is a loam with a slightly acid pH (6.1). Soil phosphorus is low at just 4 ppm which may limit plant growth and development where 10 ppm is thought to be the minimum. The extensive rock layer underneath can be seen in the nearby exposed cliffs and a deep (15 foot) narrow crack in the rock, almost like a slot canyon, east of the baseline. There are some bare soils in the open, but overall there is excellent litter cover. Total litter cover exceeds 90%. Due to the level terrain, there is little hazard of erosion. Some trampled and disturbed places display soil movement, but it is not severe.

The transect runs through the edge of an aspen grove. Therefore, aspen is more prevalent here than in surrounding areas where more Ponderosa pine predominate. Point quarter data from 1999 estimate 48 aspen and 157 Ponderosa pine trees/acre. Average diameter of aspen is estimated at 5 inches while Ponderosa averages 5.7 inches. The aspen are mainly mature trees averaging 25-30 feet tall, so most forage production is unavailable for animal use. Small young trees and suckers are available and were moderate to heavily utilized in 1992. The one young aspen classified on the density plots in 1986 was 16 feet tall, vigorous and unavailable. Most of the young plants are smaller and showed moderate to heavy browsing use, yellowed leaves and poor vigor in 1992.

The most abundant and available browse is mountain snowberry. It contributes to most of the available browse. The community has an open aspect because of the low-growing shrub understory. More than 50% of the snowberry population were young plants in 1986 and 1992. Use has varied from moderate to heavy in 1986 and 1992, to light in 1999. Density increased in 1992, but this was mostly due to observer differences in counting this rhizomatous shrub between years. Strip frequency between years is within 1%, 90% vs 89%. Density estimates for 1999 are similar to 1986 estimates at about 7,800 plants/acre. A variety of other palatable browse species also occur including, low-growing myrtle pachystima, serviceberry, and scattered oak. Oregon grape is numerous and could provide some forage although it is not a very palatable plant.

The herbaceous understory is diverse and moderately abundant considering the amount of litter cover and shade from tree canopy. Identifying grasses was difficult because of heavy livestock use in 1986. In 1992, overall utilization was moderate and many grasses produced seed. Common grasses include, Kentucky bluegrass (increaser with moderate grazing), sedge, bottlebrush squirreltail, nodding brome, and slender

wheatgrass. Only light use was noted on the grasses in 1999. Diversity of forbs is also high. The most conspicuous species was thickleaf peavine, which showed light use. Low growing forbs like yarrow, spreading fleabane, starwort, and longleaf phlox are abundant.

1986 APPARENT TREND ASSESSMENT

A variety of browse and herbaceous forage is available on this site. The aspen appears to be preferred and heavy use may affect regeneration and future availability. Other browse plants are vigorous and produce abundant forage. Herbaceous vegetation, especially grasses, are utilized heavily by cattle. Cattle appear to be responsible for the excessive utilization of young aspen. Vegetative trend is probably stable overall, although the trend will certainly be affected by future logging programs and continued cattle use. The soil trend is stable. It is difficult to assign a trend without a clear management objective which identifies the importance of key species for providing adequate forage for big game animals.

1992 TREND ASSESSMENT

Soil trend is stable with percent bare ground down to only 2%. Protective ground cover is abundant and erosion minimal. Of the key or most preferred browse species, only serviceberry experienced a downward trend in its population. Its density is still moderately low at 680 plants/acre, reflective of the 11% decrease in its population. Being the most preferred species, it also shows an increase (from 4% to 41%) in the proportion of the population that is now heavily browsed. However, this should not be used as the principal criteria for the management of wildlife species in this area because serviceberry only makes about 1% of the total browse cover (biomass). The other preferred species, which make up the other 99% of the browse cover have shown increases in their populations indicating an upward trend for browse. The grasses make up 76% of the herbaceous understory cover, with Kentucky bluegrass providing 31% of that cover. Kentucky bluegrass is an increaser with moderate livestock use. Trend for the herbaceous understory is stable. The proportion of the herbaceous understory that is composed of Kentucky bluegrass should be monitored to determine additional changes in compositional trend.

TREND ASSESSMENT

soil - stable

browse - up

herbaceous understory - stable

1999 TREND ASSESSMENT

Trend for soil remains stable with abundant vegetation and especially litter cover. Unprotected bare ground is rare and erosion is not a problem on the site. Trend for browse is considered down slightly. Use is mostly light and vigor is generally normal, but population densities of all species declined since 1992. Cover of shrubs declined substantially for most shrubs, while strip frequency of understory shrubs is also lower. Some of these changes may be due to the canopy cover and increased shading of Ponderosa pine and aspen. Average overhead canopy cover of Ponderosa pine is estimated at 35%, while aspen averages 13%. No canopy cover estimates are available from 1992 to compare with. Trend for the herbaceous understory is stable with similar sum of nested frequencies of perennial grasses and forbs. While nested frequency of perennial grasses remained similar compared to 1992, cover declined nearly 4 fold. Cover of forbs increased from nearly 8% cover to 12%. Some of these cover differences are likely due to time the study was read and the timing of precipitation. This study was read in late August of 1992 and in late June of 1999 (6/23).

TREND ASSESSMENT

soil - stable

browse - down slightly

herbaceous understory - stable

HERBACEOUS TRENDS --
Herd unit 14 , Study no: 20

T y p e	Species	Nested Frequency			Quadrat Frequency			Average Cover %	
		'86	'92	'99	'86	'92	'99	'92	'99
G	Agropyron intermedium	b13	a-	3	5	-	1	-	.03
G	Agropyron scribneri	a-	b22	a-	-	9	-	1.42	-
G	Agropyron spicatum	3	-	-	2	-	-	-	-
G	Agropyron trachycaulum	a-	b44	c101	-	18	44	1.59	.96
G	Bromus anomalus	b50	b68	a19	26	26	7	5.02	.11
G	Bromus inermis	18	25	25	8	8	11	.31	.52
G	Carex spp.	a-	b64	b47	-	28	20	1.70	.91
G	Dactylis glomerata	b10	a-	a1	4	-	1	-	.00
G	Festuca ovina	a-	b10	ab4	-	5	2	.33	.31
G	Koeleria cristata	b12	b14	a-	6	6	-	.08	-
G	Muhlenbergia montana	b46	a5	a4	16	3	2	.06	.03
G	Phleum pratense	b19	b16	a-	8	8	-	.45	-
G	Poa fendleriana	16	17	5	7	8	3	.09	.01
G	Poa pratensis	182	161	194	67	56	65	7.88	3.19
G	Sitanion hystrix	b69	c105	a14	30	41	6	3.54	.10
G	Stipa columbiana	b83	a39	a31	35	17	13	1.07	.53
Total for Annual Grasses		0	0	0	0	0	0	0	0
Total for Perennial Grasses		521	590	448	214	233	175	23.59	6.74
Total for Grasses		521	590	448	214	233	175	23.59	6.74
F	Achillea millefolium	b171	a111	a76	63	47	31	1.43	.99
F	Antennaria rosea	a-	b11	b10	-	6	4	.63	.36
F	Arenaria congesta	-	3	3	-	1	2	.00	.03
F	Aster chilensis	6	6	2	2	2	2	.15	.06
F	Calochortus nuttallii	-	2	4	-	2	2	.01	.01
F	Collinsia parviflora (a)	-	a-	b21	-	-	8	-	.04
F	Crepis acuminata	-	-	3	-	-	1	-	.00
F	Delphinium nuttallianum	a-	a-	b26	-	-	13	-	.06
F	Draba spp. (a)	-	b11	a-	-	6	-	.03	-
F	Erigeron flagellaris	b37	ab26	a17	13	11	7	.61	.13
F	Geranium spp.	2	-	-	2	-	-	-	-
F	Lathyrus lanszwertii	132	106	138	50	42	49	2.11	4.80
F	Lomatium spp.	a-	ab4	b5	-	2	3	.03	.04
F	Lychnis drummondii	4	-	-	2	-	-	-	-
F	Microsteris gracilis (a)	-	-	5	-	-	2	-	.03
F	Penstemon spp.	a-	b4	ab1	-	3	1	.02	.00
F	Phlox longifolia	b97	a36	a17	41	18	8	.76	.06
F	Polygonum douglasii (a)	-	2	13	-	2	6	.01	.05
F	Pterospora andromedea	-	-	3	-	-	2	-	.04

Type	Species	Nested Frequency			Quadrat Frequency			Average Cover %	
		'86	'92	'99	'86	'92	'99	02	09
F	Senecio integerrimus	_b 61	_a 12	_a 9	28	7	4	.17	.05
F	Sisymbrium altissimum (a)	-	-	2	-	-	1	-	.00
F	Smilacina stellata	1	-	-	1	-	-	-	-
F	Stellaria jamesiana	_a 2	_b 81	_c 168	1	35	64	.55	3.21
F	Taraxacum officinale	59	64	56	32	29	25	.57	.96
F	Thalictrum fendleri	-	-	4	-	-	2	-	.03
F	Thlaspi spp.	_a -	_a -	_b 10	-	-	4	-	.02
F	Trifolium repens	49	42	45	18	15	18	.42	1.30
F	Unknown forb-perennial	1	-	-	1	-	-	-	-
Total for Annual Forbs		0	13	41	0	8	17	0.03	0.13
Total for Perennial Forbs		622	508	597	254	220	242	7.52	12.21
Total for Forbs		622	521	638	254	228	259	7.56	12.35

Values with different subscript letters are significantly different at $\alpha = 0.10$

BROWSE TRENDS --

Herd unit 14 , Study no: 20

Type	Species	Strip Frequency		Average Cover %	
		02	09	02	09
B	Amelanchier utahensis	13	9	.13	.07
B	Mahonia repens	68	62	3.37	1.80
B	Pachistima myrsinites	19	4	.50	.06
B	Pinus ponderosa	13	16	30.55	.98
B	Populus tremuloides	13	5	10.94	.03
B	Purshia tridentata	-	-	.03	-
B	Quercus gambelii	5	3	1.37	.06
B	Rosa woodsii	22	7	.05	.03
B	Symphoricarpos oreophilus	90	89	20.68	15.04
Total for Browse		243	195	67.66	18.07

CANOPY COVER --

Herd unit 14 , Study no: 20

Species	Percent Cover 09
Pinus ponderosa	35
Populus tremuloides	13

BASIC COVER --

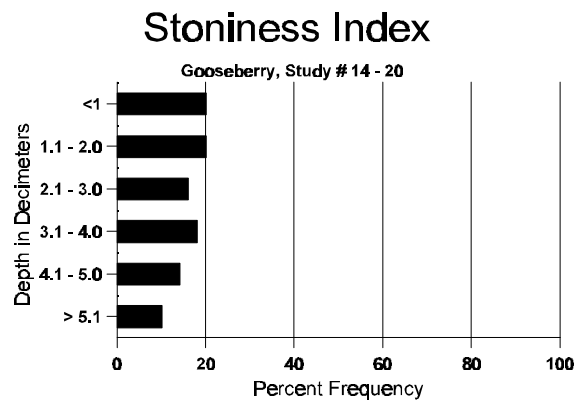
Herd unit 14 , Study no: 20

Cover Type	Nested Frequency		Average Cover %		
	'02	'09	'86	'92	'99
Vegetation	329	337	9.25	64.87	37.21
Rock	-	6	0	.37	.09
Pavement	7	6	0	0	.01
Litter	219	397	81.25	84.88	93.13
Cryptogams	19	10	.50	.76	.12
Bare Ground	16	45	9.00	1.52	1.28

SOIL ANALYSIS DATA --

Herd Unit 14, Study # 20, Study Name: Gooseberry

Effective rooting depth (inches)	Temp °F (depth)	pH	%sand	%silt	%clay	%OM	PPM P	PPM K	dS/m
20.8	49.8 (17.1)	6.1	45.4	34.0	20.6	3.0	4.0	89.6	0.4



PELLET GROUP DATA --

Herd unit 14 , Study no: 20

Type	Quadrat Frequency		Pellet Transect Days Use/Acre (ha)
	'02	'09	
Rabbit	4	1	N/A
Elk	6	2	11 (27)
Deer	8	-	11 (27)
Cattle	3	1	26 (64)

BROWSE CHARACTERISTICS --

Herd unit 14 , Study no: 20

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Amelanchier utahensis																		
S	86	7	-	-	-	-	-	-	-	-	7	-	-	-	233		7	
	92	-	1	-	-	-	-	-	-	-	1	-	-	-	20		1	
	99	5	-	-	5	-	-	-	-	-	10	-	-	-	200		10	
Y	86	9	3	1	-	-	-	-	-	-	13	-	-	-	433		13	
	92	-	15	14	-	2	-	-	-	-	20	11	-	-	620		31	
	99	11	-	-	-	-	-	-	-	-	11	-	-	-	220		11	
M	86	10	-	-	-	-	-	-	-	-	10	-	-	-	333	11	5	
	92	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	
D	86	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	92	-	3	-	-	-	-	-	-	-	3	-	-	-	60		3	
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'86		13%			04%			00%			-11%							
'92		59%			41%			00%			-68%							
'99		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'86	766	Dec:	0%			
												'92	680		9%			
												'99	220		0%			
Mahonia repens																		
S	86	21	-	-	-	-	-	-	-	-	18	-	3	-	700		21	
	92	37	2	-	15	-	-	-	-	-	54	-	-	-	1080		54	
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
Y	86	41	-	-	-	-	-	-	-	-	39	-	2	-	1366		41	
	92	280	-	-	104	-	-	6	-	-	367	13	10	-	7800		390	
	99	35	-	-	-	-	-	-	-	-	35	-	-	-	700		35	
M	86	73	-	-	-	-	-	-	-	-	63	-	10	-	2433	6	6	
	92	231	8	-	131	-	-	-	-	-	327	8	35	-	7400	-	-	
	99	244	-	-	22	-	-	-	-	-	266	-	-	-	5320	4	7	
D	86	12	-	-	-	-	-	-	-	-	12	-	-	-	400		12	
	92	3	1	-	1	-	-	-	-	-	1	3	1	-	100		5	
	99	2	-	-	-	-	-	-	-	-	-	-	2	-	40		2	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'86		00%			00%			10%			+73%							
'92		01%			00%			06%			-60%							
'99		00%			00%			.66%										
Total Plants/Acre (excluding Dead & Seedlings)												'86	4199	Dec:	10%			
												'92	15300		1%			
												'99	6060		1%			

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.	Total
		1	2	3	4	5	6	7	8	9	1	2	3	4			
Pachistima myrsinites																	
S	86	36	-	-	-	-	-	-	-	-	36	-	-	-	1200		36
	92	3	1	-	8	-	-	-	-	-	12	-	-	-	240		12
	99	-	-	-	1	-	-	-	-	-	1	-	-	-	20		1
Y	86	12	-	2	-	-	-	-	-	-	14	-	-	-	466		14
	92	16	53	-	22	1	-	1	-	-	93	-	-	-	1860		93
	99	5	-	-	-	-	-	-	-	-	5	-	-	-	100		5
M	86	20	-	-	-	-	-	-	-	-	20	-	-	-	666	5 6	20
	92	-	19	-	-	-	-	7	-	-	26	-	-	-	520	- -	26
	99	-	-	-	4	-	-	-	-	-	4	-	-	-	80	5 18	4
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>						
'86		00%			06%			00%			+52%						
'92		61%			00%			00%			-92%						
'99		00%			00%			00%									
Total Plants/Acre (excluding Dead & Seedlings)												'86	1132	Dec:	-		
												'92	2380		-		
												'99	180		-		
Pinus ponderosa																	
S	86	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0
	92	17	1	-	1	-	-	-	-	-	19	-	-	-	380		19
	99	3	-	-	-	-	-	-	-	-	3	-	-	-	60		3
Y	86	5	-	-	-	-	-	-	-	-	5	-	-	-	166		5
	92	7	-	-	-	-	-	-	-	-	7	-	-	-	140		7
	99	10	-	-	-	-	-	-	-	-	10	-	-	-	200		10
M	86	-	-	-	-	-	-	-	-	-	-	-	-	-	0	- -	0
	92	2	-	-	2	-	-	1	2	-	7	-	-	-	140	- -	7
	99	3	-	-	-	-	-	-	2	1	6	-	-	-	120	- -	6
D	86	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0
	92	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0
	99	1	-	-	-	-	-	-	-	-	-	-	-	1	20		1
X	86	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0
	92	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	20		1
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>						
'86		00%			00%			00%			+41%						
'92		00%			00%			00%			+18%						
'99		00%			06%			06%									
Total Plants/Acre (excluding Dead & Seedlings)												'86	166	Dec:	0%		
												'92	280		0%		
												'99	340		6%		

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.	Total	
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Populus tremuloides																		
S	86	-	-	1	-	-	-	-	-	-	-	-	1	-	33		1	
	92	4	24	-	-	-	-	-	-	-	21	-	7	-	560		28	
	99	4	-	-	-	-	-	-	-	-	4	-	-	-	80		4	
Y	86	-	-	-	-	-	-	1	-	-	1	-	-	-	33		1	
	92	-	5	2	-	-	-	3	-	-	7	-	3	-	200		10	
	99	5	-	-	-	-	-	-	-	-	5	-	-	-	100		5	
M	86	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	0	
	92	-	-	-	-	-	-	-	4	1	5	-	-	-	100	-	5	
	99	-	-	-	-	-	-	-	3	-	3	-	-	-	60	-	3	
D	86	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	92	-	2	1	-	-	-	-	2	-	1	-	2	2	100		5	
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
X	86	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	92	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	80		4	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'86		00%			00%			00%			+92%							
'92		35%			20%			35%			-60%							
'99		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'86	33	Dec:	0%			
												'92	400		25%			
												'99	160		0%			
Quercus gambelii																		
S	86	2	-	-	-	-	-	-	-	-	2	-	-	-	66		2	
	92	1	1	-	1	-	-	-	-	-	3	-	-	-	60		3	
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
Y	86	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	92	18	-	1	6	-	-	-	-	-	25	-	-	-	500		25	
	99	14	-	-	-	-	-	-	-	-	14	-	-	-	280		14	
D	86	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	92	-	-	7	-	-	-	-	-	-	6	-	-	1	140		7	
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'86		00%			00%			00%										
'92		00%			25%			03%			-56%							
'99		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'86	0	Dec:	0%			
												'92	640		22%			
												'99	280		0%			

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Rosa woodsii																		
S	86	3	-	-	-	-	-	-	-	-	3	-	-	-	100		3	
	92	10	3	-	-	-	-	-	-	-	13	-	-	-	260		13	
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
Y	86	15	-	-	-	-	-	-	-	-	15	-	-	-	500		15	
	92	22	7	1	2	1	-	4	-	-	36	-	1	-	740		37	
	99	8	-	-	-	-	-	-	-	-	8	-	-	-	160		8	
M	86	5	2	-	-	-	-	-	-	-	7	-	-	-	233	10	8	
	92	-	-	-	6	-	-	-	-	-	6	-	-	-	120	-	-	
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	
D	86	-	1	-	-	-	-	-	-	-	1	-	-	-	33		1	
	92	2	-	-	-	-	-	-	-	-	2	-	-	-	40		2	
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'86		13%			00%			00%			+15%							
'92		18%			02%			02%			-82%							
'99		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'86	766	Dec:	4%			
												'92	900		4%			
												'99	160		0%			
Symphoricarpos oreophilus																		
S	86	44	-	-	-	-	-	-	-	-	44	-	-	-	1466		44	
	92	57	9	-	26	-	-	2	-	-	94	-	-	-	1880		94	
	99	32	-	-	1	-	-	-	-	-	33	-	-	-	660		33	
Y	86	87	43	-	-	-	-	-	-	-	130	-	-	-	4333		130	
	92	202	88	10	38	6	-	1	-	-	333	-	3	9	6900		345	
	99	89	-	-	7	-	-	-	-	-	95	1	-	-	1920		96	
M	86	35	56	13	-	-	-	-	-	-	104	-	-	-	3466	22	20	
	92	173	115	14	1	-	-	-	-	-	300	3	-	-	6060	-	-	
	99	289	-	-	-	-	-	-	-	-	289	-	-	-	5780	19	24	
D	86	2	1	-	-	-	-	-	-	-	3	-	-	-	100		3	
	92	4	6	-	2	-	-	-	-	-	11	-	-	1	240		12	
	99	7	-	-	-	-	-	-	-	-	7	-	-	-	140		7	
X	86	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	92	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	160		8	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'86		42%			05%			00%			+40%							
'92		33%			04%			02%			-41%							
'99		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'86	7899	Dec:	1%			
												'92	13200		2%			
												'99	7840		2%			